

What is claimed is:

1. A surgical apparatus for closing a wound, the surgical apparatus comprising:  
  
a tongue member having a distal section insertable into a wound; and  
  
a face opposing the distal section of the tongue member and separated from the distal section of the tongue member by a gap, the face having an area large enough to impede further insertion of the apparatus into the wound.
2. The surgical apparatus of claim 1 wherein the tongue member includes a cross-sectional perimeter approximately filling the wound for holding the wound substantially fully open in the gap.
3. The surgical apparatus of claim 2 wherein a cross-sectional perimeter at the face is greater than the cross-sectional perimeter of the tongue.
4. The surgical apparatus of claim 1 further comprising a body portion having first and second levers pivotally secured to the body portion.
5. The surgical apparatus of claim 4 further comprising an elongate body assembly connecting the body portion to the tongue member, and further comprising first and second elongate needles positioned at least partially within the elongate body assembly, said first needle being longitudinally movable by said first lever and said second needle being longitudinally movable by said second lever.
6. The surgical apparatus of claim 5 wherein the levers are spaced apart less than 180 degrees from each other.
7. The surgical apparatus of claim 5 wherein the levers are not diametrically positioned.
8. The surgical apparatus of claim 5 wherein the first and second elongate needles are eccentrically positioned within the elongate body assembly.

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9. The surgical apparatus of claim 4 wherein the first lever is a first color to indicate its connection with the first needle, and the second lever is a second color, different than the first color, to indicate its connection with the second needle.

10. The surgical apparatus of claim 4 wherein the first and second levers are mounted to a distal end of the body portion.

11. The surgical apparatus of claim 1 further comprising a sleeve holder positioned within the distal section of the tongue member, the sleeve holder including first and second sleeves disposed within the sleeve holder, said first and second sleeves being joined by a length of suture material.

12. The surgical apparatus of claim 1 further comprising a guide wire tube disposed through said body portion and said elongate body assembly, a distal end of the guide wire tube being disposed adjacent a distal opening of the tongue member.

13. The surgical apparatus of claim 12 wherein the guide wire tube includes an opening spaced proximally the distal end thereof.

14. A needle and ferrule configuration comprising:

a needle having a shaft, the shaft having a shaft outer diameter, the needle further having a tip, the tip having a pointed distal end and an intermediate section positioned between the pointed distal end and the shaft, the intermediate section having a smaller outer diameter than the shaft outer diameter; and

a ferrule having a proximal section sized to snugly receive the intermediate section of the needle, the proximal section having an outer diameter smaller than an outer diameter of the shaft of the needle.

15. The needle and ferrule configuration of claim 14 further comprising a shoulder between the intermediate section and the shaft of the needle, the shoulder providing a transition from the shaft to the intermediate section.

16. The needle and ferrule configuration of claim 14 comprising a shoulder between the proximal section and a distal section of the ferrule, wherein the distal section of the ferrule has a smaller outer diameter than the proximal section of the ferrule.

17. The needle and ferrule configuration of claim 14 wherein the pointed distal end of the tip of the needle is conically shaped.

18. The needle and ferrule configuration of claim 14 wherein a strand of suture material is attached to a distal section of the ferrule.

19. A surgical apparatus comprising:

a body portion having a distal end and a proximal end;

a tubular portion having a distal end and a proximal end, the proximal end of the tubular portion attached to the distal end of the body portion; and,

a lever having a distal end and a proximal end, the distal end of the lever operatively coupled to the distal end of the body portion.

20. The surgical apparatus of claim 19 wherein the body portion includes a longitudinal axis and the lever includes a longitudinal axis, and further wherein the longitudinal axis of the lever is parallel to the longitudinal axis of the body portion in a closed position of the lever.

21. The surgical apparatus of claim 20 wherein the lever is actuatable to a position where the longitudinal axis of the lever is askew from the longitudinal axis of the body portion.

22. The surgical apparatus of claim 19 wherein the lever is pivotally mounted to the body portion.

23. The surgical apparatus of claim 22 further comprising a link connected at a first end to the lever and at a second end to a slidable member within the body portion.

24. The surgical apparatus of claim 23 wherein movement of the proximal end of the lever towards the proximal end of the body portion forces the slidable member to move towards the distal end of the body portion.

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25. The surgical apparatus of claim 24 further comprising a drive block, wherein the slidable member cooperates with the drive block to move the drive block correspondingly with the slidable member.

26. The surgical apparatus of claim 25 wherein the slidable member is a locking collar which surrounds a reduced diameter portion of the drive block.

27. The surgical apparatus of claim 25 wherein the drive block is biased proximally by a spring.

28. The surgical apparatus of claim 25 wherein the drive block includes a longitudinal opening for frictionally receiving a proximal end of a drive tube.

29. The surgical apparatus of claim 24 wherein the proximal end of the lever is biased away from the proximal end of the body portion.

30. The surgical apparatus of claim 23 wherein movement of the proximal end of the lever away from the proximal end of the body portion forces the slidable member to move towards the distal end of the body portion.

31. The surgical apparatus of claim 30 wherein the slidable member is a needle driver.

32. The surgical apparatus of claim 31 further comprising a needle in the tubular portion, the needle movable in response to movement of the needle driver.

33. The surgical apparatus of claim 31 wherein the lever is a first lever, the link is a first link, and the needle driver is a first needle driver, the surgical apparatus further comprising a second lever having a proximal end and a distal end, the distal end of the second lever operatively coupled to the distal end of the body portion, a second link connected at a first end to the second lever and at a second end to a second needle driver within the body portion.

34. The surgical apparatus of claim 33 wherein the second needle driver is positioned proximal to the first needle driver.

35. The surgical apparatus of claim 34 wherein first needle driver receives a first needle, and the first needle driver has a longitudinal opening dimensioned to allow a second needle to pass through the first needle driver freely to the second needle driver.

36. The surgical apparatus of claim 35 wherein the second needle driver receives the second needle.

37. The surgical apparatus of claim 36 wherein the second needle driver includes an opening dimensioned to frictionally receive the second needle, the opening for receiving the second needle being smaller than the longitudinal opening in the first needle driver for passing the second needle.

38. The surgical apparatus of claim 34 wherein the first needle driver includes another longitudinal opening dimensioned to frictionally receive the first needle, wherein the longitudinal opening receiving the first needle is smaller than the longitudinal opening for passing the second needle.

39. The surgical apparatus of claim 23 wherein the slidable member includes a tab with a hole, the second end of the lever surrounding the tab and connected to the tab via a link pin inserted through the hole and through the second end of the lever.

40. The surgical apparatus of claim 19 wherein the lever has a generally U-shaped cross-section with a flat surface of the lever lying substantially flush with the body portion in a closed position of the lever..

41. The surgical apparatus of claim 19 further comprising an end cap positioned on the proximal end of the body portion, the end cap having a recess adjacent the lever, sized for facilitating actuation of the proximal end of the lever.

42. The surgical apparatus of claim 19 wherein the lever is a first lever, the surgical apparatus further comprising a second lever having a proximal end and a distal end, the distal end of the second lever operatively coupled to the distal end of the body portion.

43. The surgical apparatus of claim 42 wherein the second lever is angularly displaced on the body portion from the first lever.

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44. The surgical apparatus of claim 43 wherein the second lever is placed less than 180 degrees from the first lever.

45. The surgical apparatus of claim 42 wherein the first lever includes a first color and the second lever includes a second color, different than the first color.

46. A tip for a surgical apparatus, the tip having a longitudinal axis, a distal end, and a proximal end, the tip further comprising:

a window for receiving tissue;

a first wall at a proximal end of the window, the first wall disposed at an angle to the longitudinal axis, the angle selected to impede insertion of the tip into a wound; and,

a second wall disposed at an angle to the longitudinal axis at a distal end of the window.

47. The tip of claim 46 wherein the second wall is disposed at an approximately 90 degree angle to the longitudinal axis.

48. The tip of claim 46 wherein the distal end of the tip is tapered to a blunt surface.

49. The tip of claim 46 further comprising a ferrule holder, the ferrule holder including the second wall.

50. The tip of claim 49 wherein the ferrule holder includes a pair of recesses for receiving ferrules.

51. The tip of claim 49 further comprising a tongue extending between the first and second walls, wherein the ferrule holder includes projections receivable within grooves of the tongue for retaining the ferrule holder on the tongue.

52. The tip of claim 51 wherein the tongue includes a lip which wraps around a distal end of the ferrule holder for further retaining the ferrule holder on the tongue.

53. The tip of claim 46 further comprising a tongue, a base of the tongue forming a bottom portion of the window.

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54. The tip of claim 53 wherein a distance from the first wall to the second wall at a bottom portion of the window is less than a distance from the first wall to the second wall at a top portion of the window.

55. The tip of claim 53 wherein a proximal end of the tongue includes a T-shaped extension.

56. The tip of claim 55 further comprising a face, the face including the first wall, the face positioned on a proximal portion of the tongue and distally of the T-shaped extension.

57. The tip of claim 56 wherein the face is retained on the tongue by a snap-fit connection.

58. The tip of claim 53 wherein the tongue includes a longitudinal opening having a proximal end and a distal end, the distal end of the longitudinal opening including an exit opening positioned proximally of the distal end of the tip.

59. The tip of claim 46 further comprising a face, the face including the first wall.

60. The tip of claim 59 wherein the face includes a pair of longitudinal openings substantially parallel with the longitudinal axis of the tip.

61. The tip of claim 60 further comprising a ferrule holder, the ferrule holder including the second wall and a pair of recesses for receiving ferrules, the pair of recesses longitudinally aligned with the pair of longitudinal openings in the face.

62. The tip of claim 61 wherein the pair of recesses for receiving ferrules further receive sutures.

63. The tip of claim 61 further comprising a pair of ferrules received within the pair of recesses, proximal ends of the ferrules facing the window, and distal ends of the ferrules connected to lengths of suture material.

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64. A tip for a surgical apparatus, the tip having a distal end, a proximal end, and a longitudinal axis, the tip further comprising:

a jaw assembly having an upper jaw and a lower jaw, a proximal end of the upper jaw connected to a proximal end of the lower jaw; and,

a jaw closer longitudinally movable relative to the jaw assembly to move a distal end of the lower jaw towards a distal end of the upper jaw when the jaw closer is moved towards the distal end of the tip.

65. The tip of claim 64 wherein the jaw closer is passable beneath the lower jaw.

66. The tip of claim 64 wherein the distal end of the lower jaw receives a suture securing element, wherein, when distal ends of the upper and lower jaws are moved towards each other, the suture securing element is crimped between the upper jaw and lower jaw.

67. The tip of claim 66 wherein the lower jaw includes a pair of arms for receiving the suture securing element.

68. The tip of claim 67 wherein the lower jaw further includes a cutting blade proximal the pair of arms.

69. The tip of claim 66 comprising a cutting blade.

70. The tip of claim 69 wherein the upper jaw includes a backstop for abutting with the cutting blade.

71. The tip of claim 64 wherein a distal end of the jaw closer includes a camming surface for abutting a camming edge of one of the upper and lower jaws.

72. The tip of claim 64 further comprising a longitudinal opening for receiving a suture securing element.

73. The tip of claim 72 further comprising an end cap at the distal end of the tip, the end cap including the longitudinal opening.

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74. A method of approximating tissue sections with a surgical tip, the surgical tip having a distal end, a proximal end, and a longitudinal axis, the method comprising:

inserting a tapered distal end of the tip between the tissue sections;

disposing a first tissue section within a gap in the tip;

placing the first tissue section against a wall of the gap;

directing a suture through the gap and the first tissue section;

moving the surgical tip;

disposing a second tissue section within the gap;

placing the second tissue section against the wall;

directing a suture through the gap and the second tissue section; and

removing the surgical tip from the tissue sections.

75. The method of claim 74 wherein moving the surgical tip comprises rotating the surgical tip.

76. The method of claim 74 further comprising threading loose ends of the suture through a distal end of a suture securing device and crimping a securing member upon the suture.

77. The method of claim 76 further comprising pulling the suture tight prior to crimping the securing member upon the suture.

78. The method of claim 76 further comprising cutting the suture while crimping the securing member upon the suture.

79. The method of claim 78 further comprising moving a single lever one time for cutting the suture and crimping the securing member.

80. An obturator assembly and cannula for locating a suturing instrument in a vessel, the obturator assembly and cannula comprising:

a flexible tubular member having a first longitudinal bore for receiving a guide wire;

a flexible outer sleeve having a second longitudinal bore encircling the flexible tubular member, the outer sleeve having an aspiration port in a side of the second longitudinal bore disposed between a proximal and a distal end thereof; and,

a cannula having a third longitudinal bore sized for surrounding the flexible outer sleeve. ~

81. The obturator assembly and cannula of claim 80 wherein the tubular member comprises a distal end that is more flexible than a proximal end.

82. The obturator assembly and cannula of claim 80 wherein the flexible tubular member is longer than the outer sleeve.

83. The obturator assembly and cannula of claim 80 wherein a proximal end of the assembly has a valve assembly with fittings.

84. The obturator assembly and cannula of claim 83 wherein one fitting in the valve assembly is in fluid communication with the second longitudinal bore allowing blood aspiration to positively indicate proper positioning of the surrounding cannula.

85. A single use kit for closing an opening in a vessel comprising:

a surgical apparatus for suturing the opening; and,

a combination crimper and cutter for securing a suture and cutting its ends.

86. The single use kit of claim 85 further comprising a cannula.

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87. The single use kit of claim 85 wherein the surgical apparatus comprises a tip having a longitudinal axis, a distal end, and a proximal end, the tip further comprising:

a gap for receiving tissue;

a first wall at a proximal end of the gap, the first wall having a pair of longitudinal openings for receiving needles; and,

a second wall at a distal end of the window, the second wall having a pair of ferrule recesses for receiving ferrules.

88. The single use kit of claim 85 wherein the combination crimper and cutter comprises a tip having a distal end, a proximal end, and a longitudinal axis, the tip further comprising:

a jaw assembly having an upper jaw and a lower jaw, a proximal end of the upper jaw connected to a proximal end of the lower jaw; and,

a jaw closer longitudinally movable relative to the jaw assembly to move a distal end of the lower jaw towards a distal end of the upper jaw when the jaw closer is moved towards the distal end of the tip.

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